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CAVE-FOSSIL VERTEBRATES FROM CAMAGUEY, CUBA

By KARL F. KOOPMAN

Department of Biology, Queens College, Flushing, New York

and RODOLFO RUIBAL

Division of Life Sciences, University of California, Riverside

Of all the Cuban provinces, Camaguey is the least known in regard to its former and present vertebrate fauna. With this fact in mind the junior author, in January of 1952, visited the Sierra de Cubitas in Camaguey with the purpose of locating cave-fossil material.

The Sierra de Cubitas is a range of low (maximum altitude of 750 feet) Tertiary and Cretaceous limestone hills running northwest to southeast along the northern half of Camaguey. The hills rise abruptly from the flat serpentine Camaguey savanna, and are covered by one of the few remaining tracts of tropical forest in the province. Two caves were visited by the junior author. Both are located on the south slope of the hills, at the Trinchera de Martin Castillo (the site of a battle during the war against Spain), which is about seven kilometers west of the village of Banao. The first cave was the Cueva del Indio (referred to as Cave 1 henceforth in the text), an extensive cave that is on occasion visited by excursionists from the city of Camaguey. The second cave lies a short distance east of Cave 1, and will be designated as Cave 2, since it bears no known name.

The present entrance to Cave 1 is a broad, high-domed opening which is continuous with the large chamber from which the deeper passages of the cave extend. Due to the ample entrance the entire chamber is well within the twilight zone. The floor of the chamber has been excavated for bat guano. The entrance to the cave is higher than the chamber floor, and consists of rocks fallen from the eroded cave front. The red soil of the chamber

was damp, but at higher levels near the entrance the soil was dry. However, during rains, water enters the cave and material has been deposited at different levels near the entrance. All of the fossil material collected was found as surface litter deposited at different points near the cave entrance. Material was extremely abundant, any handful from the surface yielding many bones and snail shells. Collections were made at random from the many pockets where the litter consisted almost exclusively of bones and snail shells.

In the case of Cave 2 erosion has cut back so that it has exposed to direct sunlight a former high dome, about seventy feet high) with massive stalactites and stalagmites along the sides. In this cave, digging for bat guano had only ceased two years previous to the time of the visit and consequently the entire floor of this shallow cave is covered with the mounds of red litter that were screened out by the guano collectors and the material washed out from these mounds by the rain. The abundance of bones in this cave can only be described by saying that there are millions. To walk in any part of this cave is to walk upon a floor of bones and snail shells. Collecting in this cave was essentially the same as in Cave 1, but of a greater volume. The material was scooped up at random from the mounds and from the floor. Due to the little time available no adequate investigation was done in any of the more protected parts of the cave where material was still undisturbed by the guano collectors.

The snail shells collected were kindly identified by Dr. W. J. Clench of Harvard University. Eight species were found and according to Dr. Clench all the species are at present common in Camaguey.

MATERIAL COLLECTED

Class MAMMALIA

Order INSECTIVORA

Nesophontes micrus. Represented by one maxilla, eight mandibles, three femora, and one humerus from Cave 1, and by two partial skulls, eight mandibles, and three femora from Cave 2. This species was first described from the provinces of Matanzas (Allen, 1917b), and later from Oriente (Anthony, 1919) and Isla de Pinos (Allen, 1918). In addition there is material in the Museum of Comparative Zoology from Las Villas and Pinar

del Rio, and in the United States National Museum from Habana province. The present material from Camaguey completes the record and demonstrates that the species existed throughout Cuba.

Solenodon cubanus. Represented by a portion of one mandible and six isolated teeth from Cave 1. At least two individuals are represented in the material collected. This species is known today as a living animal only from Oriente (*S. poeyi* is considered a subspecies, following Aguayo, 1950). It has previously been found fossil in both Oriente (Allen, 1918) and Pinar del Rio (Aguayo, 1950). It apparently also occurred in the Sierra de Trinidad in the province of Las Villas up until the middle of the nineteenth century (Gundlach, 1895). The present material agrees well with fresh specimens from Oriente, but differs by somewhat larger size and robustness. Since the species was differentiated into two subspecies in Oriente, and the animals from the Sierra de Trinidad appear to have been distinct in color from the Oriente forms, it is possible that the Camaguey material may represent a different subspecies. However, the material available is not adequate to determine this.

Order CHIROPTERA

Macrotus waterhousei. Represented by two mandibles from Cave 1, and a portion of one skull and three mandibles from Cave 2. This species was previously known from Isla de Pinos and all the provinces except Camaguey. Apparently a common and widely distributed form.

Monophyllus cubanus. A single mandible from Cave 2. A single periotic bone from Cave 2 is also allocated to this species. All recent records of this bat appear to be from Oriente, but Gundlach (1868, pp. 48, 49) records it from Rangel in Pinar del Rio.

Brachyphylla nana. Represented by two mandibles from Cave 1, and nine partial skulls and 18 mandibles from Cave 2. This species was previously known from all the provinces of Cuba except Camaguey and Isla de Pinos. A common and widespread species.

Artibeus jamaicensis. Represented by five partial skulls and two mandibles from Cave 1, and eight partial skulls and twenty-

six mandibles from Cave 2. Presumably known from all the provinces of Cuba and from Isla de Pinos, though we have been unable to find any definite record for Matanzas. Several specimens of this species were shot in Cave 1. A very common and widespread species.

Phyllops falcatus. Represented by two partial skulls and three mandibles from Cave 1, and ten partial skulls and twelve mandibles from Cave 2. Previously recorded from Oriente, Las Villas, Matanzas, and Pinar del Rio, but probably occurs throughout Cuba and Isla de Pinos. None of the fossil material from Camaguey represents *P. vetus*, still known only as fossil from Oriente (Anthony, 1919).

Erophylla sezekorni. Represented by two mandibles from Cave 1, and two rostra and seven mandibles from Cave 2. Previously known from Habana, Las Villas, and Oriente, it is probably rather widespread in Cuba.

Phyllonycteris poeyi. Represented by one mandible from Cave 1, and by ten rostra and fifteen mandibles from Cave 2. Previously known from Pinar del Rio, Habana, Matanzas, Las Villas, and Oriente, and is thus a widespread species.

Natalus primus. Represented by a single mandible and a fragmentary rostrum from Cave 2. This species was first described as a fossil from Oriente by Anthony (1919), but it is also known from Las Villas (Koopman, unpublished). Our record is the first from anywhere else and the first rostral material, the other finds consisting entirely of mandibles. Known only as fossil, this species was apparently rare but probably fairly widespread.

Tadarida brasiliensis. (We follow G. M. Allen, 1911, in considering *T. muscula* a subspecies of *T. brasiliensis*.) Represented by two rostra and two mandibles from Cave 2. Previously known from all the provinces of the Cuban mainland. Evidently a common and widespread form.

Tadarida molossa. Represented by one rostrum and one mandible from Cave 2. These appear to be the first Cuban specimens of this species with definite locality data, *T. macrotis*, a synonym, having been described only from "the interior of Cuba" (Allen, 1911). Apparently a very rare or local form.

The geographic data for the bats were obtained from Miller (1904), Allen (1911), Peterson (1917), Anthony (1919) and from the specimens in the collections of the Museum of Compara-

tive Zoology at Harvard, the American Museum of Natural History in New York City, and the United States National Museum in Washington, D. C.

Order RODENTIA

Boromys offella. Represented by one mandible and two isolated teeth from Cave 2. Originally described as fossil from Oriente (Miller, 1916) it has since been recorded from Las Villas (Allen, 1918), Pinar del Rio (Museum of Comparative Zoology specimens), and Isla de Pinos (Allen, 1918). It apparently was formerly a widespread species.

Boromys torrei. Represented by one mandible from Cave 1 and by two rostra, fifteen mandibles, and three isolated teeth from Cave 2. Ten auditory bullae from the latter deposit are also tentatively referred here. This species has previously been found in Oriente (Anthony, 1919), Las Villas (Museum of Comparative Zoology), Matanzas (Allen, 1918), and Pinar del Rio (Museum of Comparative Zoology), and also on Isla de Pinos (Allen, 1918). Evidently this was formerly a widespread and common species.

Capromys (Mystateles) nana. Represented by a single tooth from Cave 1, and by one rostrum, four mandibles, and six isolated teeth from Cave 2. This species is known as a living animal only from the Cienega de Zapata (Allen, 1918 and 1942), and as a fossil was only known from Matanzas (Allen, 1917a), Las Villas (Allen, 1918), and Oriente (Anthony, 1919). Apparently originally rather widespread.

Capromys (Mystateles) prehensilis. A single rostral fragment from Cave 2 is best allocated to this form. The species occurs in Pinar del Rio, Habana, Matanzas, and Las Villas, and is represented by a subspecies on Isla de Pinos (Mohr, 1939). A widespread form in western and central Cuba.

Capromys (Geocapromys) columbianus. Represented by one mandible and five isolated teeth from Cave 1, and by three mandibles and five isolated teeth from Cave 2. This species was originally described from cave-fossil material from Las Villas (Chapman, 1892), and it has since been recorded from Oriente (Anthony, 1919), Matanzas, Pinar del Rio, and from Isla de Pinos. Apparently once a common and widespread form.

Rattus. Represented by many partial skulls, mandibles, and

posteranial skeletal parts from Cave 1 and Cave 2.

Mus. Skeletal remains from both Cave 1 and Cave 2. Not as abundant as the *Rattus* remains.

A great deal of posteranial and some cranial material, particularly of rodents, remains unidentified.

Class AVES

The bird remains collected at Cave 1 and Cave 2 were not identified.

Class REPTILIA Order SQUAMATA

Anolis lucius. A few dentaries and maxillary elements from Cave 1 are referable to this species. In Cave 2 only a single parietal of this species was found. This is, at present, a common lizard inhabiting the limestone walls at the entrance of the caves.

Anolis equestris. Represented by the proximal portion of a lower jaw and portion of one maxilla from Cave 2. This species was observed inhabiting the forest outside of the caves.

Leiocephalus sp. A large dentary that seems to represent a species of *Leiocephalus* was collected at Cave 1. Part of a maxilla from Cave 1, and a dentary and a maxilla from Cave 2 are also referable to this genus.

Tarentola americana. This rare gekkonid species is represented by a single dentary from Cave 2.

Alsophis angulifer. A few vertebrae from Cave 2 are referable to this species of snake.

Some cranial and posteranial reptilian material from Caves 1 and 2 remains unidentified.

Class AMPHIBIA Order ANURA

Hyla septentrionalis. Cranial and posteranial elements of this common tree frog were the most abundant non-mammalian remains to be found in Cave 1 and Cave 2. Some of the bones found appeared to be more rugged and larger than those of the two skeletons prepared for comparison.

DISCUSSION

Most of this collection probably represents the result of owl predation. However, it is probable that some of the material does not represent owl pellet remains but rather bones washed into the cave, the remains of animals that took refuge in the cave, or remains of native kitchen middens.

None of the material was stratified, all of it having been inter-mixed by the diggings for bat guano. It is therefore impossible to establish the relative age of the fossils. The presence of two introduced European species — *Rattus* and *Mus* — proves that at least part of the material collected is post-Columbian in age. However, the presence of species now extinct in Cuba — *Nesophontes*, *Natalus primus*, *Boromys*, and *Capromys* (*Geocapromys*) *columbianus* — or extinct in Camaguey — *Solenodon* and *Capromys* (*Mystateles*) *nana* — suggests an early pre-Columbian age for some of the material. There is no evidence of difference in age or type of deposition between Cave 1 and Cave 2.

The collections from these caves also establishes the presence of a number of species previously not recorded from Camaguey.

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